1154-03-227 **Russell Miller*** (russell.miller@qc.cuny.edu), Mathematics Dept. – Queens College, CUNY, 65-30 Kissena Blvd., Queens, NY 11367. *Lusin's Theorem: How Computability Theory Proves a Real-Analysis Result.*

Lusin's Theorem, from real analysis, states that for every Borel-measurable function f from $\mathbb{R}$ to $\mathbb{R}$, and for every $\epsilon > 0$, there exists a continuous function g on $\mathbb{R}$ such that $\{x \in \mathbb{R} : f(x) \neq g(x)\}$ has measure $< \epsilon$. This result appears in most introductory real analysis courses, and is often viewed as one of Littlewood's Three Principles.

Here we will give a proof of Lusin's Theorem using computability theory and computable analysis. In addition to the theorem itself, the proof will establish an effective way of producing g from f and ϵ, and will pick out, for each f, the specific measure-0 set of troublemakers x in $\mathbb{R}$ that create all the discontinuities.

This talk will not assume any background in logic or computability theory. It will introduce a few standard computability results, bearing no obvious connection to real analysis, and by the end it will show how those results are precisely enough to establish Lusin's Theorem. (Received August 25, 2019)